Prepared By:

GM BluePlan
ENGINEERING

Stormwater Management Report

East Ridge Business Park - Blocks 3 & 4
Plan 16M-44 - Owen Sound, ON

Andpet Realty Ltd.

GMBP File: 221210

August 2021
Revised: July 2022

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PLAN 16M-44, OWEN SOUND
STORMWATER MANAGEMENT REPORT
AUGUST 2021
REVISED: JULY 2022

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1.   INTRODUCTION AND BACKGROUND

Andpet Realty Ltd. proposes to develop Blocks 3 and 4, Plan 16M-44, along 27th Avenue East, in the East Ridge Business Park located within commercial subdivision lands on the north westerly corner of 28th Avenue East and 16th Street East in the City of Owen Sound as shown in Figure No. 1. The property Owner, Andpet Realty Ltd. has requested that GM BluePlan Engineering Limited (GMBP) prepare a Stormwater Management (SWM) Report for the proposed development per the recommendation of the January 2011 Surface Water Management Report (2011 Report) prepared by GMBP (formerly Gamsby and Mannerow Limited).

The Owner proposes ultimately to develop the property with 10 storage buildings constructed across the property. This includes one two-storey building with an attached office and maintenance building on the south end of the site. Parking will along the north side of the two-storey building and office. For the purposes of this report, 27th Avenue East is assumed to be aligned in a north-south direction.

This report has been prepared by GMBP to document the design of the SWM system of the proposed development in support of Site Plan Approval.

2.   EXISTING CONDITIONS AND DESIGN CRITERIA

Under existing conditions, the 2.01 ha property is undeveloped with no existing buildings. The existing conditions are as described in the 2011 Report.

Per the City of Owen Sound and the 2011 Report's individual lot requirements, the design criteria are as follows:

1. Post-development flows from the site during all storm events up to, and including, a 100-year design storm event, are expected to be attenuated to the existing condition peak flow rate of the respective storm event.

2. An "Enhanced" level of water quality treatment (80% long-term TSS Removal) is provided prior to runoff discharging from the subject property.

3. Thermal mitigation measures are employed on-site to reduce the potential temperature increase due to the proposed lot development.

3. POST-DEVELOPMENT CONDITIONS AND STORMWATER MANAGEMENT PLAN

The site is planned to be developed in phases. Ultimately, the site will have 10 storage buildings with one of the storage buildings being two-stories and having an attached office space. Proposed parking areas are located southerly side of the site, north of the two-story building and office space. The total combined area of the proposed buildings is approximately 5,600 m². The entrance to the site is proposed from 27th Avenue East at the southeast corner of the subject property. Stormwater runoff from the proposed development is to be attenuated by a stormwater management system at the north end of the site prior to draining from the site.

A 998 m² SWM pond is proposed along the northerly side of the subject property to provide stormwater attenuation for runoff from the entire site. A 125 mm diameter orifice plate is proposed on the outlet of the SWM pond to attenuate flow from the on-site storm sewer to the 18th Street East ditch. The orifice plate slowly releases runoff from the system, and the SWM pond allows stormwater to temporarily pond within the voids of the stone, until it can slowly drain from the site. Given the existing soil conditions it is unlikely that infiltration will provide impactful drainage from the site.

An emergency overflow weir is proposed for runoff to spill overland to the 18th Street East ditch under emergency situations only.

4. QUANTITY CONTROL CRITERIA, PARAMETERS AND MODELLING

4.1 Design Rainfall Events

The City of Owen Sound Engineering Standards provide rainfall data for design storms in the form of Chicago Storm Parameters. The Chicago storm input parameters used to model the various design rainfall events for the subject property are summarized in the following Table 1.

Table 1 - Design Rainfall Events – Provided by the City of Owen Sound Engineering Standards

Coefficient	1:2-Year	1:5-Year	1:25-Year	1:100-Year
A	854.100	1234.576	1750.276	2171.754
B	7.781	8.297	8.303	8.303
C	0.830	0.851	0.862	0.867
R	0.375	0.375	0.375	0.375
Duration (min)	180	180	210	210
Depth (mm)	33.228	42.929	59.007	71.271
Intensity (mm/hr)	101.673	134.692	165.718	202.862

4.2   Site Soil Conditions

The soil type within the subject property is characterized as Harkaway Silt Loam which consists of silt loam over brown loam over brown clay over calcareous till, as per the Grey County Soils Map (Ontario Soil Survey Report No. 17) published by the Department of Agriculture. The Harkaway Silt Loam soil type is known to be of the Hydrological Soil Group (HSG) BC. These soils generally have properties not conducive to infiltration.

An SCS Curve Number of 71 for unimproved lands on the site was used based on Design Chart 1.09: Soil/Land Use Curve Numbers provided by the US Department of Agriculture,1972. Impervious surfaces within the subject property are associated with an SCS Curve Number of 98.

4.3   Existing and Post-Development Catchment Areas

The entire site under existing conditions was modelled as Catchment 10 with an imperviousness of 0% for the entire subject area. It is worth noting that the existing conditions reflect the catchment area and drainage outlet information provided in the 2011 Report. Runoff from the entire site generally drains from southeast to northwest towards the 18th Street East Ditch.

Under proposed conditions, the site was modelled as one catchment area (Catchment 100) with an imperviousness of 75%, based on the overall proposed site conditions. There are several catch basins proposed throughout the site to drain runoff through on-site storm sewers to the proposed stormwater management pond that will attenuate post-development peak flows to less than existing condition peak flows.

The existing and proposed condition drainage areas are shown on Figure No. 2. The existing and proposed conditions catchments are outlined in Table 2 below.

The Stage-Storage-Discharge design calculations are attached as Appendix A and MIDUSS computer modelling is attached as Appendix B.

The results of the routing analysis are summarized in Section 4.4.

Table 2 – Existing and Proposed Condition Catchments

Catchment	Description	Area (ha)	Impervious Level (%)
10	Existing Conditions – Entire Property	2.01	0
100	Proposed Conditions – Entire Property	2.01	75

4.4   MIDUSS Quantity Control Modelling Results

MIDUSS modelling software was used to model the expected post-development conditions stormwater runoff from the subject property during the various design storm events. Results from the models are summarized in the following tables, and the modelling is provided for reference in Appendix B.

Table 3 below also provides the total peak flow rates discharging from the subject property under post-development conditions as modelled in MIDUSS.

Table 3: Comparison of Allowable and Post-Development Peak Flow Runoff Rates

Storm Return Period (year)	1:2	1:5	1:25	1:100
Pro-Rated Allowable Peak Flow Rate (m³/s)	0.008	0.021	0.054	0.091
Post-Development Peak Flow Rates (m³/s)	0.006	0.013	0.039	0.041

As shown in Table 3 above, under post-development conditions, the peak flow discharge rates from the proposed SWM pond would be less than the allowable release rates (existing conditions) for all design storm events up to, and including, the 1:100-year design storm event.

Table 4 below summarizes the capacity available at the various stages in the stormwater management pond and provides a comparison to the capacity that is expected to be used during the various design storm events.

Table 4: Stage-Storage-Discharge Capacities for Stormwater Management Pond

	Available Capacity in SWM Facility Design			Capacity Used During Various Design Storm Events		
	Peak Flow (m³/s)	Storage Volume (m³)	Storage Elevation (m)	Peak Flow (m³/s)	Storage Volume (m³)	Storage Elevation (m)
Bottom of Stone Trench	0.000	0	223.95	---	---	---
C/L of First Row of Perforations on Vertical Riser Outlet (First Controlled Outlet)	0.000	11.0	224.10			
Top of Stone/Bottom of Pond	0.004	56.0	224.50			
10 mm "First Flush"				0.004	81.6	224.54
1:2-year Design Storm				0.006	395.4	224.77
DICB L/S Grate	0.006	521.1	224.85			
1:5-year Design Storm	---	---	---	0.013	536.4	224.86
1:25-year Design Storm	---	---	---	0.039	658.4	224.94
1:100-year Design Storm	---	---	---	0.041	828.7	225.05
Overflow Weir	0.041	837.0	225.05	---	---	---
Top of Bank	0.167	998.0	225.15	---	---	---

As shown in Table 4 above, during all design storm events up to, and including, the 1:100-year return, the runoff is expected to discharge via the orifice outlet without spilling via the overflow weir.

5. STORMWATER QUALITY TREATMENT

Based on the requirements from the City of Owen Sound, the on-site quality control for the stormwater flow is to achieve an 80% long term total suspended solids (TSS) removal rate while treating 90% of the annual runoff, prior to release to the off-site receiving drainage system.

The post-development site, Catchment 100, features primarily paved areas bordered with grassed areas. Stormwater quality treatment for Catchment 100 runoff is provided by the SWM facility. The facility features a channelized section of clear stone, proposed to provide additional TSS removal. All inflows conveyed through the channelized section of the SWM facility during a minor storm event (<10 mm rainfall depth) are proposed to flow through the clear stone prior to reaching the outlet. The clear stone will slow the flow through the facility to encourage sediment to settle out, and to provide treatment during minor storm events by directing runoff through it prior to discharging from the proposed SWM facility.

As shown in Table 4, all flow to the SWM facility is conveyed through the clear stone to the perforated vertical riser pipe during a 2-year design storm event.

For a site with at least 85% imperviousness, and when using a dry pond for water quality treatment, the Ministry of the Environment and Climate Change Stormwater Management Planning and Design Manual (MOECC SWMPD Manual) recommends 240 m^3/ha of stormwater storage capacity to meet 60% long-term TSS removal. Based on this requirement, the proposed detention area should have a minimum volume of approximately 482 m^3 of capacity. The proposed stormwater detention facility has a storage volume of 837 m^3 at the overflow weir.

It is expected that this process of treatment with the pond volume over the requirements and the channelized clear stone will meet the MOECC enhanced level of 80% long-term TSS removal.

6. STORMWATER TEMPERATURE MITIGATION

Temperature mitigation measures are required due to the temperature increase often associated with SWM facilities as is outlined in section 4.4 of the 2011 Report. The measures outlined below are proposed to be implemented to reduce the impact of temperature increase on the stormwater draining from the site.

While planting vegetation along the edges of the SWM pond to increase shade may help to reduce the temperature of the stormwater, the main method of mitigation is provided from the channel of clear stone located within the stormwater management facility. From Section 4.4 of the SWMPDG, "treatment of water, by routing the discharge through a subsurface trench filled with clear stone, has also been suggested to reduce temperature", and that, "the trench should be designed to accommodate [the conveyance of peak runoff rate during] frequent events (i.e., <10 mm) which will have a greater effect on the thermal regime of the receiving water". As discussed in Section 5.1, all runoff draining to the SWM facility is proposed to be conveyed through the channelized section of clear stone prior to draining to the outlet system. Therefore, the channelized sections of clear stone are expected to provide thermal cooling effects to inflows as heat is transferred from the runoff to the clear stone.

7. SUMMARY

The proposed development includes the construction of ten (10) storage buildings totalling approximately 5,600 m^2 and parking areas. The site is an approximately 2.01 ha property located on blocks 3 & 4 in the East Ridge Business Park in the City of Owen Sound.

Upon completion of the proposed development;

1. The proposed drainage outlet is the 18th Street East ditch draining westerly via the SWM Pond.

2. Post-development flows from the site during all storm events up to, and including, a 100-year design storm event, are expected to be attenuated to the existing condition peak flow rate of the respective storm event.

3. An Emergency Overland spill route is provided to direct runoff to the 18th Street East ditch during storm events in excess of a 100-year design storm event, without spilling to neighbouring properties or reaching the finished floor elevation of any of the proposed buildings.

4. An "Enhanced" level of water quality treatment (80% TSS Removal) is provided by a clear stone channel in the SWM Pond and exceeding the pond volume requirement of the MOECC prior to discharging from the subject property.

All of which is respectfully submitted,
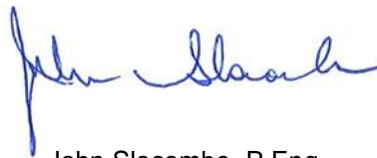
GM BLUEPLAN ENGINEERING LIMITED

Prepared by: Reviewed by:

Ethan C.J. Webb, P.Eng.   John Slocombe, P.Eng.

FIGURES:

221210
Blocks 3 & 4 Development
East Ridge Business Park
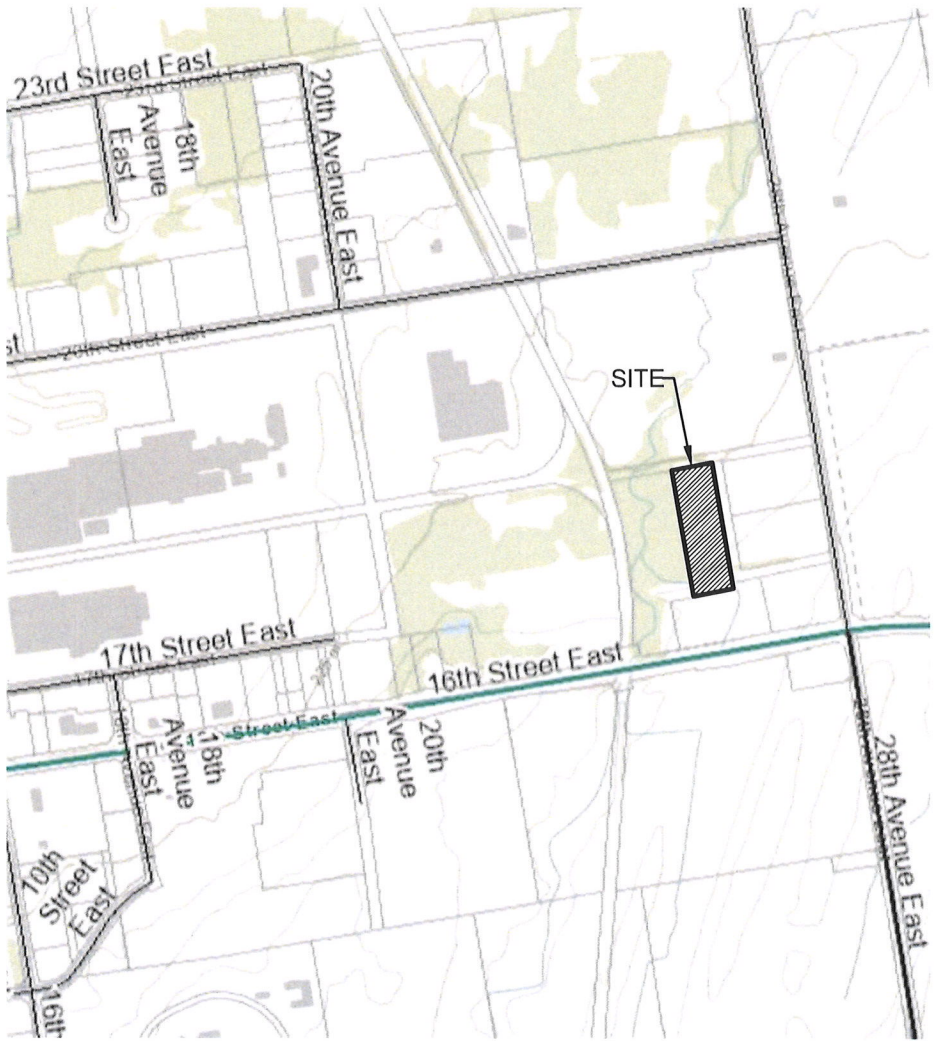
SITE

SCALE = 1:750
JULY 2022

SITE LOCATION MAP

Andpet Realty
Blocks 3 & 4, Plan 16M-44
City of Owen Sound

Figure No. 1

GM BluePlan
ENGINEERING

221210
Blocks 3 & 4 Development
East Ridge Business Park

Block 5, Plan 16M-44

Block 6, Plan 16M-44

17th Street East

525mmø PE STM

450mmø PE STM

300mmø PE STM

27th Avenue East

375mmø PE STM

375mmø PE STM

375mmø PE STM

300mmø PE STM

CBMH-B-9

CBMH-B-3

CBMH-B-2

CBMH-B-1

CB-3

CB-1

300mmø PE STM

18th Street East

600mmø PE STM

375mmø PE STM

150mmø PERF SUBDRAIN

PROPOSED SURFACE WATER MANAGEMENT POND

MH-B-8

375mmø PE STM

DICB-6

200mmø RISER

375mmø PE STM

300mmø PE STM

300mmø PE STM

CB-2

Block 4, Plan 16M-44

Block 3, Plan 16M-44

Block 2, Plan 16M-44

PROPOSED BUILDING

10/100
2.0 ha
0%/75%

CB-4

CB-5

CBMH-B-7

CBMH-B-5

CBMH-B-4

CB-6

CBMH-B-6

375mmø PE STM

375mmø PE STM

300mmø PE STM

200mmø PVC STM

200mmø PVC STM

Block 7, Plan 16M-44

LEGEND

– – – – DRAINAGE BOUNDARY

(10/100 2.0 ha 0%/75%) EXISTING/PROPOSED CATCHMENT NUMBER
CATCHMENT AREA
PERCENT IMPERVIOUS

⌁ DIRECTION OF SURFACE FLOW

SCALE = 1:1,000
JULY 2022

EXISTING & PROPOSED
CONDITIONS DRAINAGE AREA

Andpet Realty
Blocks 3 & 4, Plan 16M-44
City of Owen Sound

Figure No. 2

GM BluePlan
ENGINEERING

APPENDIX A:
STAGE-STORAGE-DISCHARGE CALCULATIONS

Block 4 - East Ridge Business Park
City of Owen Sound
Our File: 221210
July 2022

STORAGE VOLUME CALCULATIONS

ELEV	INC D	STONE SURFACE AREA	STONE AVERAGE AREA	INC. STONE STORAGE VOL	OPEN STORAGE AREA	AVERAGE OPEN STORAGE AREA	INC. OPEN STORAGE VOL	ACCUM. VOLUME	
(m)	(m)	(m²)	(m²)	(m³)	(m²)	(m²)	(m²)	(m³)	
223.90	0.00	120.80	0.00	0.00	0	0	0	0	B/ Stone Trench
223.95	0.05	120.80	121	2.4	0	0	0	0	
224.00	0.10	175.71	148	3.0	0	0	0	3	
224.05	0.15	194.01	185	3.7	0	0	0	7	
224.10	0.20	212.32	203	4.1	0	0	0	11	Perforation
224.15	0.25	230.62	221	4.4	0	0	0	15	
224.20	0.30	248.92	240	4.8	0	0	0	20	Perforation
224.25	0.35	267.22	258	5.2	0	0	0	25	
224.30	0.40	285.53	276	5.5	0	0	0	31	Perforation
224.35	0.45	303.83	295	5.9	0	0	0	37	
224.40	0.50	322.13	313	6.3	0	0	0	43	Perforation
224.45	0.55	340.44	331	6.6	0	0	0	49	
224.50	0.60	358.74	350	7.0	0	0	0	56	Top of Stone/B Pond
224.55	0.65	0.00	0	0.0	1349	675	34	90	
224.60	0.70	0	0	0.0	1377	1363	68	158	
224.65	0.75	0	0	0.0	1406	1392	70	228	
224.70	0.80	0	0	0.0	1435	1420	71	299	
224.75	0.85	0	0	0.0	1464	1449	72	371	
224.80	0.90	0	0	0.0	1493	1478	74	445	
224.85	0.95	0	0	0.0	1522	1508	75	521	
224.90	1.00	0	0	0.0	1552	1537	77	598	T/G Secondary Outlet
224.95	1.05	0	0	0.0	1582	1567	78	676	
225.00	1.10	0	0	0.0	1612	1597	80	756	
225.05	1.15	0	0	0.0	1643	1628	81	837	Weir
225.10	1.20	0	0	0.0	1674	1658	83	920	Overflow
225.15	1.25	0	0	0.0	1454	1564	78	998	Overflow

PERFORATED RISER OUTLET

Vertical Perforated 200 mm Riser
Area based on 6 perf. per 0.10 m of vertical pipe
Perforation Diameter = 1.27 cm (0.5")
Cd = 0.6
Area of Each Perf. = 0.0001267 m²
Starting Elevation = 224.10 m
Ending Elevation = 224.40 m
Top of Solid Cap = 224.50 m

SECONDARY OUTLET PIPE

Orifice Dia. = 125 mm
Orifice Area = 0.012 m²
Coefficient = 0.6
Invert Elev = 223.90

WEIR CALCULATIONS

d1 = 225.15 m
h = 225.05 m
H = 0.10 m
2g = 19.612
L = 2 m

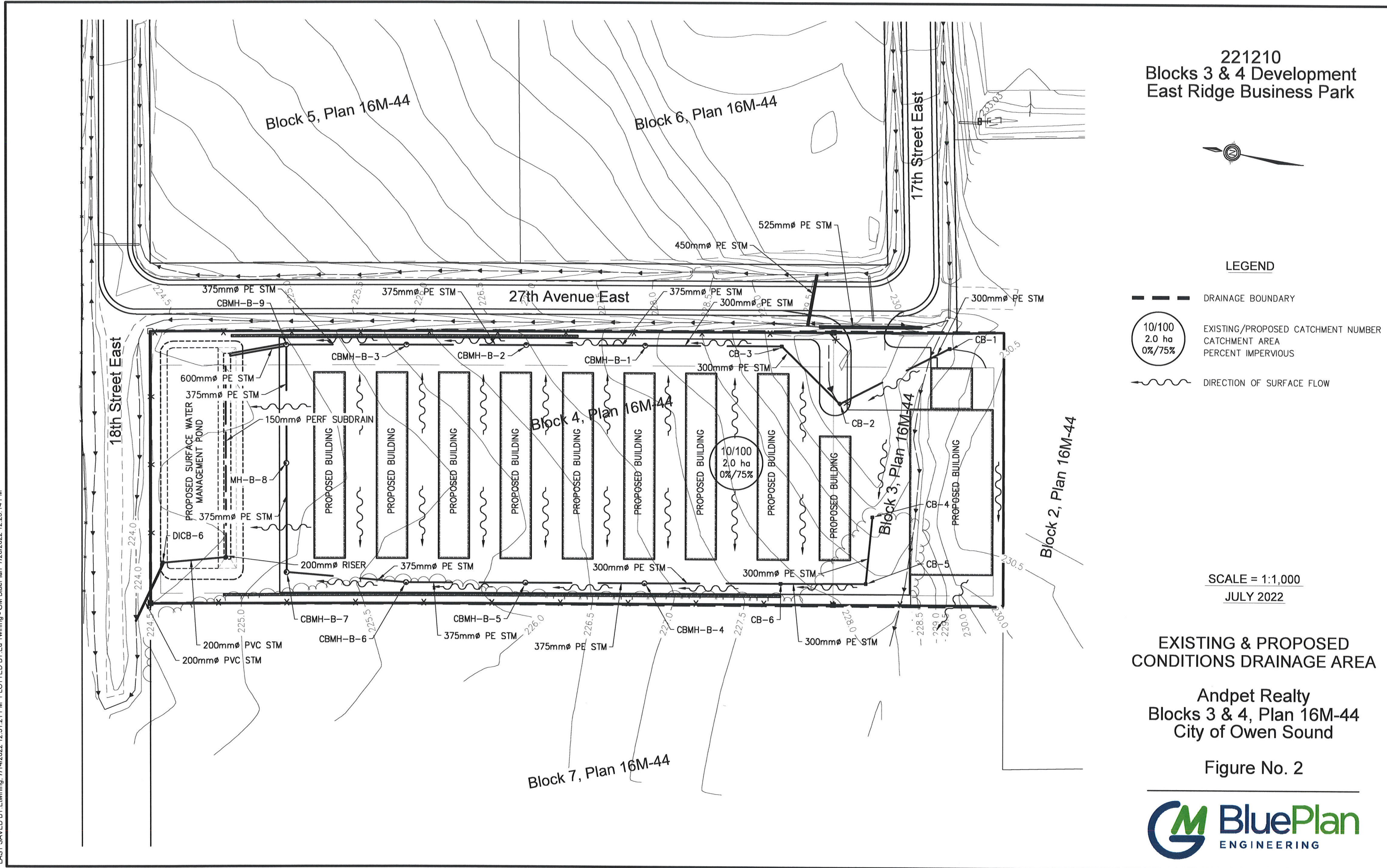### STAGE-STORAGE-DISCHARGE CALCULATIONS

ELEV	STAGE	STORAGE	PERF RISER OUTLET FLOW	SECONDARY OUTLET FLOW	WEIR OUTLET FLOW	TOTAL OUTLET FLOW	
(m)	(m)	(m³)	(m³/s)	(m³/s)	(m³/s)	(m³/s)	
223.90	0.00	0	0.0000	0.000	0.000	0.000	B/ Stone Trench
223.95	0.05	0	0.0000	0.000	0.000	0.000	
224.00	0.05	3	0.0000	0.000	0.000	0.000	
224.05	0.10	7	0.0000	0.000	0.000	0.000	
224.10	0.15	11	0.0000	0.000	0.000	0.000	Perforation
224.15	0.20	15	0.0005	0.000	0.000	0.000	
224.20	0.25	20	0.0006	0.000	0.000	0.001	Perforation
224.25	0.30	25	0.0012	0.000	0.000	0.001	
224.30	0.35	31	0.0015	0.000	0.000	0.002	Perforation
224.35	0.40	37	0.0022	0.000	0.000	0.002	
224.40	0.45	43	0.0026	0.000	0.000	0.003	Perforation
224.45	0.50	49	0.0034	0.000	0.000	0.003	
224.50	0.55	56	0.0039	0.000	0.000	0.004	Top of Stone/B Pond
224.55	0.60	90	0.0043	0.000	0.000	0.004	
224.60	0.65	158	0.0047	0.000	0.000	0.005	
224.65	0.70	228	0.0051	0.000	0.000	0.005	
224.70	0.75	299	0.0054	0.000	0.000	0.005	
224.75	0.80	371	0.0057	0.000	0.000	0.006	
224.80	0.85	445	0.0060	0.000	0.000	0.006	
224.85	0.90	521	0.0062	0.000	0.000	0.006	T/G Secondary Outlet
224.90	0.95	598	0.0065	0.032	0.000	0.038	
224.95	1.00	676	0.0067	0.032	0.000	0.039	
225.00	1.05	756	0.0070	0.033	0.000	0.040	
225.05	1.10	837	0.0072	0.034	0.000	0.041	Weir
225.10	1.15	920	0.0074	0.035	0.041	0.083	Overflow
225.15	1.20	998	0.0076	0.036	0.124	0.167	Overflow

**APPENDIX B:
MIDUSS MODELLING**

```
"            MIDUSS Output ----------------------------------------------->"
"            MIDUSS version                        Version 2.25  rev. 473"
"            MIDUSS created                   Sunday, February 07, 2010"
"      10    Units used:                                   ie METRIC"
"            Job folder:          \\os-2012r2\Users_Private\ewebb\Documents\"
"                                        MIDUSS\221210\July 2022"
"            Output filename:        Ex. and Post 1 (10mm Flush) yr.out"
"            Licensee name:                                   gmbp"
"            Company                                              "
"            Date & Time last used:        7/18/2022 at 8:41:29 AM"
" 31        TIME PARAMETERS"
"       5.000   Time Step"
"      60.000   Max. Storm length"
"     360.000   Max. Hydrograph"
" 32        STORM Canada AES"
"       4    Canada AES"
"      10.000   Rainfall depth"
"      60.000   Duration"
"      21.000   Time to peak"
"       7.000   Decay factor"
"            Maximum intensity          31.121    mm/hr"
"            Total depth                10.000    mm"
"       5    10hyd   Hydrograph extension used in this file"
" 33        CATCHMENT 10"
"       1    Triangular SCS"
"       1    Equal length"
"       1    SCS method"
"      10    Pre "
"       0.000   % Impervious"
"       2.010   Total Area"
"     200.000   Flow length"
"       2.900   Overland Slope"
"       2.010   Pervious Area"
"     200.000   Pervious length"
"       2.900   Pervious slope"
"       0.000   Impervious Area"
"     200.000   Impervious length"
"       2.900   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      75.000   Pervious SCS Curve No."
"       0.001   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       8.467   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                  0.000     0.000     0.000     0.000 c.m/sec"
"            Catchment 10          Pervious   Impervious Total Area "
```

```
"                    Surface Area          2.010      0.000      2.010      hectare"
"                    Time of concentration 494.543    11.147     494.236    minutes"
"                    Time to Centroid       251.502    35.181     251.364    minutes"
"                    Rainfall depth         10.000     10.000     10.000     mm"
"                    Rainfall volume        201.00     0.00       201.00     c.m"
"                    Rainfall losses        9.990      3.878      9.990      mm"
"                    Runoff depth           0.010      6.122      0.010      mm"
"                    Runoff volume          0.19       0.00       0.19       c.m"
"                    Runoff coefficient     0.001      0.000      0.001      "
"                    Maximum flow           0.000      0.000      0.000      c.m/sec"
" 40              HYDROGRAPH Start - New Tributary"
"            2    Start - New Tributary"
"                     0.000      0.000      0.000      0.000"
" 33              CATCHMENT 100"
"            1    Triangular SCS"
"            1    Equal length"
"            1    SCS method"
"          100    Post"
"       75.000    % Impervious"
"        2.010    Total Area"
"       20.000    Flow length"
"        2.000    Overland Slope"
"        0.503    Pervious Area"
"       20.000    Pervious length"
"        2.000    Pervious slope"
"        1.507    Impervious Area"
"       20.000    Impervious length"
"        2.000    Impervious slope"
"        0.250    Pervious Manning 'n'"
"       75.000    Pervious SCS Curve No."
"        0.003    Pervious Runoff coefficient"
"        0.100    Pervious Ia/S coefficient"
"        8.467    Pervious Initial abstraction"
"        0.015    Impervious Manning 'n'"
"       98.000    Impervious SCS Curve No."
"        0.596    Impervious Runoff coefficient"
"        0.100    Impervious Ia/S coefficient"
"        0.518    Impervious Initial abstraction"
"                     0.095      0.000      0.000      0.000 c.m/sec"
"                    Catchment 100          Pervious   Impervious Total Area "
"                    Surface Area           0.503      1.507      2.010      hectare"
"                    Time of concentration  138.874    3.130      3.330      minutes"
"                    Time to Centroid       154.799    27.218     27.406     minutes"
"                    Rainfall depth         10.000     10.000     10.000     mm"
"                    Rainfall volume        50.25      150.75     201.00     c.m"
"                    Rainfall losses        9.974      4.035      5.520      mm"
"                    Runoff depth           0.026      5.965      4.480      mm"
"                    Runoff volume          0.13       89.92      90.05      c.m"
"                    Runoff coefficient     0.003      0.596      0.448      "
"                    Maximum flow           0.000      0.095      0.095      c.m/sec"
```

```
"  40            HYDROGRAPH Add Runoff "
"            4    Add Runoff "
"                    0.095     0.095     0.000     0.000"
"  54            POND DESIGN"
"        0.095    Current peak flow      c.m/sec"
"        0.040    Target outflow      c.m/sec"
"         90.1    Hydrograph volume      c.m"
"          26.    Number of stages"
"      223.900    Minimum water level     metre"
"      225.150    Maximum water level     metre"
"      223.900    Starting water level     metre"
"            0    Keep Design Data: 1 = True; 0 = False"
"                Level Discharge     Volume"
"               223.900    0.000     0.000"
"               223.950  1.01E-05  1.01E-05"
"               224.000  2.01E-05     2.965"
"               224.050  3.01E-05     6.662"
"               224.100  4.01E-05    10.726"
"               224.150   0.00050    15.155"
"               224.200   0.00060    19.950"
"               224.250   0.00120    25.112"
"               224.300   0.00150    30.639"
"               224.350   0.00220    36.533"
"               224.400   0.00260    42.792"
"               224.450   0.00340    49.418"
"               224.500   0.00390    56.410"
"               224.550   0.00430    90.135"
"               224.600   0.00470   158.292"
"               224.650   0.00510   227.871"
"               224.700   0.00540   298.882"
"               224.750   0.00570   371.339"
"               224.800   0.00600   445.252"
"               224.850   0.00620   520.635"
"               224.900   0.03810   597.500"
"               224.950   0.03910   675.859"
"               225.000   0.04020   755.723"
"               225.050   0.04120   837.105"
"               225.100   0.08320   920.017"
"               225.150    0.1672   998.211"
"            Peak outflow                0.004     c.m/sec"
"            Maximum level              224.537     metre"
"            Maximum storage             81.632     c.m"
"            Centroidal lag               4.883     hours"
"                    0.095     0.095     0.004     0.000 c.m/sec"
```

```
"                        MIDUSS Output -------------------------------------------------->"
"                        MIDUSS version                        Version 2.25  rev. 473"
"                        MIDUSS created                        Sunday, February 07, 2010"
"        10      Units used:                                              ie METRIC"
"                Job folder:              \\os-2012r2\Users_Private\ewebb\Documents\"
"                                                      MIDUSS\221210\July 2022"
"                Output filename:                          Ex. and Post 2 yr.out"
"                Licensee name:                                         gmbp"
"                Company                                                      "
"                Date & Time last used:              7/18/2022 at 8:37:37 AM"
" 31             TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"      360.000   Max. Hydrograph"
" 32             STORM Chicago storm"
"          1     Chicago storm"
"      854.100   Coefficient A"
"        7.781   Constant B"
"        0.830   Exponent C"
"        0.375   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"                Maximum intensity            101.673      mm/hr"
"                Total depth                   33.228      mm"
"          6     002hyd    Hydrograph extension used in this file"
" 33             CATCHMENT 10"
"          1     Triangular SCS"
"          1     Equal length"
"          1     SCS method"
"         10     Entire Site - Existing Conditions"
"        0.000   % Impervious"
"        2.010   Total Area"
"      200.000   Flow length"
"        2.900   Overland Slope"
"        2.010   Pervious Area"
"      200.000   Pervious length"
"        2.900   Pervious slope"
"        0.000   Impervious Area"
"      200.000   Impervious length"
"        2.900   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       71.000   Pervious SCS Curve No."
"        0.117   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"       10.375   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
```

```
"                                   0.008      0.000      0.000      0.000 c.m/sec"
"                      Catchment 10            Pervious    Impervious Total Area  "
"                      Surface Area            2.010       0.000      2.010       hectare"
"                      Time of concentration   92.403      6.399      92.403      minutes"
"                      Time to Centroid         197.322    94.221     197.322     minutes"
"                      Rainfall depth          33.228      33.228     33.228      mm"
"                      Rainfall volume         667.87      0.00       667.88      c.m"
"                      Rainfall losses         29.341      5.213      29.341      mm"
"                      Runoff depth            3.886       28.015     3.886       mm"
"                      Runoff volume           78.11       0.00       78.11       c.m"
"                      Runoff coefficient      0.117       0.000      0.117       "
"                      Maximum flow            0.008       0.000      0.008       c.m/sec"
" 40                   HYDROGRAPH Start - New Tributary"
"                  2   Start - New Tributary"
"                                   0.008      0.000      0.000      0.000"
" 33                   CATCHMENT 100"
"                  1   Triangular SCS"
"                  1   Equal length"
"                  1   SCS method"
"                100   Entire Site - Post-Dev."
"             75.000   % Impervious"
"              2.010   Total Area"
"             20.000   Flow length"
"              2.000   Overland Slope"
"              0.503   Pervious Area"
"             20.000   Pervious length"
"              2.000   Pervious slope"
"              1.507   Impervious Area"
"             20.000   Impervious length"
"              2.000   Impervious slope"
"              0.250   Pervious Manning 'n'"
"             71.000   Pervious SCS Curve No."
"              0.124   Pervious Runoff coefficient"
"              0.100   Pervious Ia/S coefficient"
"             10.375   Pervious Initial abstraction"
"              0.015   Impervious Manning 'n'"
"             98.000   Impervious SCS Curve No."
"              0.839   Impervious Runoff coefficient"
"              0.100   Impervious Ia/S coefficient"
"              0.518   Impervious Initial abstraction"
"                                   0.305      0.000      0.000      0.000 c.m/sec"
"                      Catchment 100           Pervious    Impervious Total Area  "
"                      Surface Area            0.503       1.507      2.010       hectare"
"                      Time of concentration   25.948      1.797      2.932       minutes"
"                      Time to Centroid         132.813    87.255     89.396      minutes"
"                      Rainfall depth          33.228      33.228     33.228      mm"
"                      Rainfall volume         166.97      500.91     667.88      c.m"
"                      Rainfall losses         29.106      5.365      11.300      mm"
"                      Runoff depth            4.122       27.863     21.928      mm"
"                      Runoff volume           20.71       420.03     440.75      c.m"
```

```
"                 Runoff coefficient     0.124      0.839      0.660       "
"                 Maximum flow           0.005      0.305      0.305      c.m/sec"
" 40              HYDROGRAPH Add Runoff "
"           4     Add Runoff "
"                   0.305      0.305      0.000      0.000"
" 54              POND DESIGN"
"        0.305    Current peak flow    c.m/sec"
"        0.046    Target outflow    c.m/sec"
"        440.7    Hydrograph volume    c.m"
"         26.     Number of stages"
"      223.900    Minimum water level     metre"
"      225.150    Maximum water level     metre"
"      223.900    Starting water level     metre"
"           0     Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge      Volume"
"                 223.900    0.000      0.000"
"                 223.950    1.01E-05   1.01E-05"
"                 224.000    2.01E-05    2.965"
"                 224.050    3.01E-05    6.662"
"                 224.100    4.01E-05   10.726"
"                 224.150    0.00050    15.155"
"                 224.200    0.00060    19.950"
"                 224.250    0.00120    25.112"
"                 224.300    0.00150    30.639"
"                 224.350    0.00220    36.533"
"                 224.400    0.00260    42.792"
"                 224.450    0.00340    49.418"
"                 224.500    0.00390    56.410"
"                 224.550    0.00430    90.135"
"                 224.600    0.00470   158.292"
"                 224.650    0.00510   227.871"
"                 224.700    0.00540   298.882"
"                 224.750    0.00570   371.339"
"                 224.800    0.00600   445.252"
"                 224.850    0.00620   520.635"
"                 224.900    0.03810   597.500"
"                 224.950    0.03910   675.859"
"                 225.000    0.04020   755.723"
"                 225.050    0.04120   837.105"
"                 225.100    0.08320   920.017"
"                 225.150    0.1672    998.211"
"                 Peak outflow              0.006      c.m/sec"
"                 Maximum level           224.766      metre"
"                 Maximum storage         395.411      c.m"
"                 Centroidal lag           14.158      hours"
"                   0.305      0.305      0.006      0.000 c.m/sec"
```

```
"                    MIDUSS Output -------------------------------------------------->"
"                    MIDUSS version                        Version 2.25  rev. 473"
"                    MIDUSS created                 Sunday, February 07, 2010"
"          10    Units used:                                    ie METRIC"
"                    Job folder:              \\os-2012r2\Users_Private\ewebb\Documents\"
"                                                   MIDUSS\221210\July 2022"
"                    Output filename:                    Ex. and Post 5 yr.out"
"                    Licensee name:                                    gmbp"
"                    Company                                              "
"                    Date & Time last used:          7/18/2022 at 8:33:19 AM"
" 31             TIME PARAMETERS"
"          5.000    Time Step"
"        180.000    Max. Storm length"
"        360.000    Max. Hydrograph"
" 32             STORM Chicago storm"
"            1    Chicago storm"
"      1234.580    Coefficient A"
"          8.297    Constant B"
"          0.851    Exponent C"
"          0.375    Fraction R"
"        180.000    Duration"
"          1.000    Time step multiplier"
"                    Maximum intensity          134.693      mm/hr"
"                    Total depth                  42.929      mm"
"            6    005hyd    Hydrograph extension used in this file"
" 33             CATCHMENT 10"
"            1    Triangular SCS"
"            1    Equal length"
"            1    SCS method"
"          10    Entire Site - Existing Conditions"
"          0.000    % Impervious"
"          2.010    Total Area"
"        200.000    Flow length"
"          2.900    Overland Slope"
"          2.010    Pervious Area"
"        200.000    Pervious length"
"          2.900    Pervious slope"
"          0.000    Impervious Area"
"        200.000    Impervious length"
"          2.900    Impervious slope"
"          0.250    Pervious Manning 'n'"
"         71.000    Pervious SCS Curve No."
"          0.177    Pervious Runoff coefficient"
"          0.100    Pervious Ia/S coefficient"
"         10.375    Pervious Initial abstraction"
"          0.015    Impervious Manning 'n'"
"         98.000    Impervious SCS Curve No."
"          0.000    Impervious Runoff coefficient"
"          0.100    Impervious Ia/S coefficient"
"          0.518    Impervious Initial abstraction"
```

```
"                                    0.021     0.000     0.000     0.000 c.m/sec"
"                     Catchment 10          Pervious   Impervious Total Area  "
"                     Surface Area            2.010      0.000      2.010     hectare"
"                     Time of concentration  69.279      5.646     69.278     minutes"
"                     Time to Centroid       173.873    91.776    173.873     minutes"
"                     Rainfall depth          42.929     42.929     42.929    mm"
"                     Rainfall volume        862.87       0.00     862.87     c.m"
"                     Rainfall losses         35.340      5.350     35.340    mm"
"                     Runoff depth             7.589     37.579      7.589    mm"
"                     Runoff volume          152.54       0.00     152.54     c.m"
"                     Runoff coefficient       0.177      0.000      0.177    "
"                     Maximum flow             0.021      0.000      0.021    c.m/sec"
" 40           HYDROGRAPH Start - New Tributary"
"           2    Start - New Tributary"
"                     0.021     0.000     0.000     0.000"
" 33           CATCHMENT 100"
"         1    Triangular SCS"
"         1    Equal length"
"         1    SCS method"
"       100    Entire Site - Post-Dev."
"    75.000    % Impervious"
"     2.010    Total Area"
"    20.000    Flow length"
"     2.000    Overland Slope"
"     0.503    Pervious Area"
"    20.000    Pervious length"
"     2.000    Pervious slope"
"     1.507    Impervious Area"
"    20.000    Impervious length"
"     2.000    Impervious slope"
"     0.250    Pervious Manning 'n'"
"    71.000    Pervious SCS Curve No."
"     0.181    Pervious Runoff coefficient"
"     0.100    Pervious Ia/S coefficient"
"    10.375    Pervious Initial abstraction"
"     0.015    Impervious Manning 'n'"
"    98.000    Impervious SCS Curve No."
"     0.867    Impervious Runoff coefficient"
"     0.100    Impervious Ia/S coefficient"
"     0.518    Impervious Initial abstraction"
"                     0.426     0.000     0.000     0.000 c.m/sec"
"                     Catchment 100         Pervious   Impervious Total Area  "
"                     Surface Area            0.503      1.507      2.010     hectare"
"                     Time of concentration  19.454      1.585      2.747     minutes"
"                     Time to Centroid       121.159    85.654     87.961     minutes"
"                     Rainfall depth          42.929     42.929     42.929    mm"
"                     Rainfall volume        215.72     647.15     862.87     c.m"
"                     Rainfall losses         35.166      5.695     13.063    mm"
"                     Runoff depth             7.763     37.234     29.866    mm"
"                     Runoff volume           39.01     561.30     600.31     c.m"
```

```
"                    Runoff coefficient     0.181      0.867      0.696        "
"                    Maximum flow           0.012      0.425      0.426      c.m/sec"
" 40               HYDROGRAPH Add Runoff "
"            4     Add Runoff "
"                        0.426       0.426      0.000       0.000"
" 54               POND DESIGN"
"         0.426    Current peak flow    c.m/sec"
"         0.017    Target outflow     c.m/sec"
"         600.3    Hydrograph volume     c.m"
"           26.    Number of stages"
"       223.900    Minimum water level     metre"
"       225.150    Maximum water level     metre"
"       223.900    Starting water level     metre"
"             0    Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge     Volume"
"                  223.900    0.000      0.000"
"                  223.950    1.01E-05   1.01E-05"
"                  224.000    2.01E-05      2.965"
"                  224.050    3.01E-05      6.662"
"                  224.100    4.01E-05     10.726"
"                  224.150    0.00050     15.155"
"                  224.200    0.00060     19.950"
"                  224.250    0.00120     25.112"
"                  224.300    0.00150     30.639"
"                  224.350    0.00220     36.533"
"                  224.400    0.00260     42.792"
"                  224.450    0.00340     49.418"
"                  224.500    0.00390     56.410"
"                  224.550    0.00430     90.135"
"                  224.600    0.00470    158.292"
"                  224.650    0.00510    227.871"
"                  224.700    0.00540    298.882"
"                  224.750    0.00570    371.339"
"                  224.800    0.00600    445.252"
"                  224.850    0.00620    520.635"
"                  224.900    0.03810    597.500"
"                  224.950    0.03910    675.859"
"                  225.000    0.04020    755.723"
"                  225.050    0.04120    837.105"
"                  225.100    0.08320    920.017"
"                  225.150    0.1672     998.211"
"                  Peak outflow            0.013      c.m/sec"
"                  Maximum level         224.860      metre"
"                  Maximum storage       536.375      c.m"
"                  Centroidal lag         16.676      hours"
"                        0.426      0.426      0.013      0.000 c.m/sec"
```

```
"              MIDUSS Output ------------------------------------------------>"
"              MIDUSS version                    Version 2.25  rev. 473"
"              MIDUSS created          Sunday, February 07, 2010"
"       10     Units used:                          ie METRIC"
"              Job folder:          \\os-2012r2\Users_Private\ewebb\Documents\"
"                                         MIDUSS\221210\July 2022"
"              Output filename:             Ex. and Post 25 yr.out"
"              Licensee name:                         gmbp"
"              Company                                    "
"              Date & Time last used:       7/18/2022 at 8:28:23 AM"
" 31            TIME PARAMETERS"
"        5.000    Time Step"
"      210.000    Max. Storm length"
"      360.000    Max. Hydrograph"
" 32            STORM Chicago storm"
"          1    Chicago storm"
"     1750.276    Coefficient A"
"        8.303    Constant B"
"        0.862    Exponent C"
"        0.375    Fraction R"
"      210.000    Duration"
"        1.000    Time step multiplier"
"            Maximum intensity          165.717     mm/hr"
"            Total depth                 59.007     mm"
"          6    025hyd   Hydrograph extension used in this file"
" 33            CATCHMENT 10"
"          1    Triangular SCS"
"          1    Equal length"
"          1    SCS method"
"         10    Entire Site - Existing Conditions"
"        0.000    % Impervious"
"        2.010    Total Area"
"      200.000    Flow length"
"        2.900    Overland Slope"
"        2.010    Pervious Area"
"      200.000    Pervious length"
"        2.900    Pervious slope"
"        0.000    Impervious Area"
"      200.000    Impervious length"
"        2.900    Impervious slope"
"        0.250    Pervious Manning 'n'"
"       71.000    Pervious SCS Curve No."
"        0.258    Pervious Runoff coefficient"
"        0.100    Pervious Ia/S coefficient"
"       10.375    Pervious Initial abstraction"
"        0.015    Impervious Manning 'n'"
"       98.000    Impervious SCS Curve No."
"        0.000    Impervious Runoff coefficient"
"        0.100    Impervious Ia/S coefficient"
"        0.518    Impervious Initial abstraction"
```

```
"                           0.054     0.000     0.000     0.000 c.m/sec"
"              Catchment 10           Pervious  Impervious Total Area "
"              Surface Area           2.010     0.000     2.010     hectare"
"              Time of concentration  49.499    5.160     49.499    minutes"
"              Time to Centroid       168.462   102.651   168.461   minutes"
"              Rainfall depth         59.007    59.007    59.007    mm"
"              Rainfall volume        1186.04   0.00      1186.05   c.m"
"              Rainfall losses        43.792    5.436     43.792    mm"
"              Runoff depth           15.215    53.571    15.215    mm"
"              Runoff volume          305.82    0.00      305.82    c.m"
"              Runoff coefficient     0.258     0.000     0.258     "
"              Maximum flow           0.054     0.000     0.054     c.m/sec"
" 40          HYDROGRAPH Start - New Tributary"
"          2   Start - New Tributary"
"                           0.054     0.000     0.000     0.000"
" 33          CATCHMENT 100"
"          1   Triangular SCS"
"          1   Equal length"
"          1   SCS method"
"        100   Entire Site - Post-Dev."
"     75.000   % Impervious"
"      2.010   Total Area"
"     20.000   Flow length"
"      2.000   Overland Slope"
"      0.503   Pervious Area"
"     20.000   Pervious length"
"      2.000   Pervious slope"
"      1.507   Impervious Area"
"     20.000   Impervious length"
"      2.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"     71.000   Pervious SCS Curve No."
"      0.262   Pervious Runoff coefficient"
"      0.100   Pervious Ia/S coefficient"
"     10.375   Pervious Initial abstraction"
"      0.015   Impervious Manning 'n'"
"     98.000   Impervious SCS Curve No."
"      0.896   Impervious Runoff coefficient"
"      0.100   Impervious Ia/S coefficient"
"      0.518   Impervious Initial abstraction"
"                           0.535     0.000     0.000     0.000 c.m/sec"
"              Catchment 100          Pervious  Impervious Total Area "
"              Surface Area           0.503     1.507     2.010     hectare"
"              Time of concentration  13.900    1.449     2.557     minutes"
"              Time to Centroid       127.186   97.087    99.765    minutes"
"              Rainfall depth         59.007    59.007    59.007    mm"
"              Rainfall volume        296.51    889.53    1186.05   c.m"
"              Rainfall losses        43.521    6.164     15.503    mm"
"              Runoff depth           15.487    52.844    43.504    mm"
"              Runoff volume          77.82     796.62    874.44    c.m"
```

```
"                    Runoff coefficient     0.262     0.896     0.737      "
"                    Maximum flow           0.031     0.533     0.535      c.m/sec"
" 40                 HYDROGRAPH Add Runoff "
"            4       Add Runoff "
"                       0.535     0.535     0.000     0.000"
" 54                 POND DESIGN"
"         0.535      Current peak flow    c.m/sec"
"         0.356      Target outflow    c.m/sec"
"         874.4      Hydrograph volume    c.m"
"          26.       Number of stages"
"        223.900     Minimum water level    metre"
"        225.150     Maximum water level    metre"
"        223.900     Starting water level    metre"
"            0       Keep Design Data: 1 = True; 0 = False"
"                    Level  Discharge     Volume"
"                    223.900    0.000      0.000"
"                    223.950  1.01E-05   1.01E-05"
"                    224.000  2.01E-05     2.965"
"                    224.050  3.01E-05     6.662"
"                    224.100  4.01E-05    10.726"
"                    224.150   0.00050    15.155"
"                    224.200   0.00060    19.950"
"                    224.250   0.00120    25.112"
"                    224.300   0.00150    30.639"
"                    224.350   0.00220    36.533"
"                    224.400   0.00260    42.792"
"                    224.450   0.00340    49.418"
"                    224.500   0.00390    56.410"
"                    224.550   0.00430    90.135"
"                    224.600   0.00470   158.292"
"                    224.650   0.00510   227.871"
"                    224.700   0.00540   298.882"
"                    224.750   0.00570   371.339"
"                    224.800   0.00600   445.252"
"                    224.850   0.00620   520.635"
"                    224.900   0.03810   597.500"
"                    224.950   0.03910   675.859"
"                    225.000   0.04020   755.723"
"                    225.050   0.04120   837.105"
"                    225.100   0.08320   920.017"
"                    225.150   0.1672    998.211"
"                    Peak outflow              0.039      c.m/sec"
"                    Maximum level           224.939      metre"
"                    Maximum storage         658.328      c.m"
"                    Centroidal lag           13.073      hours"
"                       0.535     0.535     0.039     0.000 c.m/sec"
```

```
"              MIDUSS Output -------------------------------------------------->"
"              MIDUSS version                       Version 2.25  rev. 473"
"              MIDUSS created                 Sunday, February 07, 2010"
"      10      Units used:                                ie METRIC"
"              Job folder:              \\os-2012r2\Users_Private\ewebb\Documents\"
"                                              MIDUSS\221210\July 2022"
"              Output filename:                Ex. and Post 100 yr.out"
"              Licensee name:                                gmbp"
"              Company                                          "
"              Date & Time last used:          7/18/2022 at 8:26:32 AM"
" 31            TIME PARAMETERS"
"       5.000   Time Step"
"     210.000   Max. Storm length"
"     360.000   Max. Hydrograph"
" 32            STORM Chicago storm"
"         1    Chicago storm"
"    2171.754   Coefficient A"
"       8.303   Constant B"
"       0.867   Exponent C"
"       0.375   Fraction R"
"     210.000   Duration"
"       1.000   Time step multiplier"
"           Maximum intensity          202.862      mm/hr"
"           Total depth                 71.271      mm"
"         6    100hyd   Hydrograph extension used in this file"
" 33            CATCHMENT 10"
"         1    Triangular SCS"
"         1    Equal length"
"         1    SCS method"
"        10    Entire Site - Existing Conditions"
"       0.000   % Impervious"
"       2.010   Total Area"
"     200.000   Flow length"
"       2.900   Overland Slope"
"       2.010   Pervious Area"
"     200.000   Pervious length"
"       2.900   Pervious slope"
"       0.000   Impervious Area"
"     200.000   Impervious length"
"       2.900   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      71.000   Pervious SCS Curve No."
"       0.313   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"      10.375   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
```

```
"                                     0.091     0.000     0.000     0.000 c.m/sec"
"                    Catchment 10            Pervious   Impervious Total Area  "
"                    Surface Area            2.010      0.000      2.010       hectare"
"                    Time of concentration   42.231     4.735      42.230      minutes"
"                    Time to Centroid        159.260    101.449    159.260     minutes"
"                    Rainfall depth          71.271     71.271     71.271      mm"
"                    Rainfall volume         1432.55    0.00       1432.55     c.m"
"                    Rainfall losses         48.990     5.636      48.990      mm"
"                    Runoff depth            22.281     65.635     22.281      mm"
"                    Runoff volume           447.85     0.00       447.85      c.m"
"                    Runoff coefficient      0.313      0.000      0.313       "
"                    Maximum flow            0.091      0.000      0.091       c.m/sec"
" 40                 HYDROGRAPH Start - New Tributary"
"                2   Start - New Tributary"
"                            0.091     0.000     0.000     0.000"
" 33                 CATCHMENT 100"
"                1   Triangular SCS"
"                1   Equal length"
"                1   SCS method"
"              100   Entire Site - Post-Dev."
"           75.000   % Impervious"
"            2.010   Total Area"
"           20.000   Flow length"
"            2.000   Overland Slope"
"            0.503   Pervious Area"
"           20.000   Pervious length"
"            2.000   Pervious slope"
"            1.507   Impervious Area"
"           20.000   Impervious length"
"            2.000   Impervious slope"
"            0.250   Pervious Manning 'n'"
"           71.000   Pervious SCS Curve No."
"            0.315   Pervious Runoff coefficient"
"            0.100   Pervious Ia/S coefficient"
"           10.375   Pervious Initial abstraction"
"            0.015   Impervious Manning 'n'"
"           98.000   Impervious SCS Curve No."
"            0.907   Impervious Runoff coefficient"
"            0.100   Impervious Ia/S coefficient"
"            0.518   Impervious Initial abstraction"
"                            0.676     0.000     0.000     0.000 c.m/sec"
"                    Catchment 100           Pervious   Impervious Total Area  "
"                    Surface Area            0.503      1.507      2.010       hectare"
"                    Time of concentration   11.859     1.330      2.422       minutes"
"                    Time to Centroid        122.661    96.344     99.075      minutes"
"                    Rainfall depth          71.271     71.271     71.271      mm"
"                    Rainfall volume         358.14     1074.41    1432.55     c.m"
"                    Rainfall losses         48.815     6.631      17.177      mm"
"                    Runoff depth            22.456     64.641     54.094      mm"
"                    Runoff volume           112.84     974.46     1087.30     c.m"
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"                     Runoff coefficient     0.315       0.907       0.759        "
"                     Maximum flow           0.049       0.670       0.676      c.m/sec"
" 40              HYDROGRAPH Add Runoff "
"           4     Add Runoff "
"                     0.676      0.676      0.000      0.000"
" 54              POND DESIGN"
"        0.676    Current peak flow    c.m/sec"
"        0.356    Target outflow     c.m/sec"
"       1087.3   Hydrograph volume     c.m"
"         26.    Number of stages"
"      223.900   Minimum water level      metre"
"      225.150   Maximum water level      metre"
"      223.900   Starting water level     metre"
"           0    Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge     Volume"
"                223.900     0.000       0.000"
"                223.950   1.01E-05    1.01E-05"
"                224.000   2.01E-05      2.965"
"                224.050   3.01E-05      6.662"
"                224.100   4.01E-05     10.726"
"                224.150   0.00050      15.155"
"                224.200   0.00060      19.950"
"                224.250   0.00120      25.112"
"                224.300   0.00150      30.639"
"                224.350   0.00220      36.533"
"                224.400   0.00260      42.792"
"                224.450   0.00340      49.418"
"                224.500   0.00390      56.410"
"                224.550   0.00430      90.135"
"                224.600   0.00470     158.292"
"                224.650   0.00510     227.871"
"                224.700   0.00540     298.882"
"                224.750   0.00570     371.339"
"                224.800   0.00600     445.252"
"                224.850   0.00620     520.635"
"                224.900   0.03810     597.500"
"                224.950   0.03910     675.859"
"                225.000   0.04020     755.723"
"                225.050   0.04120     837.105"
"                225.100   0.08320     920.017"
"                225.150   0.1672      998.211"
"             Peak outflow                0.041      c.m/sec"
"             Maximum level              225.045     metre"
"             Maximum storage            828.663     c.m"
"             Centroidal lag              11.687     hours"
"                     0.676      0.676      0.041      0.000 c.m/sec"
```